Superfund Green Remediation Strategy

EPA Response to Public Comments on the August 2009 "Public Review Version"

September 17, 2010

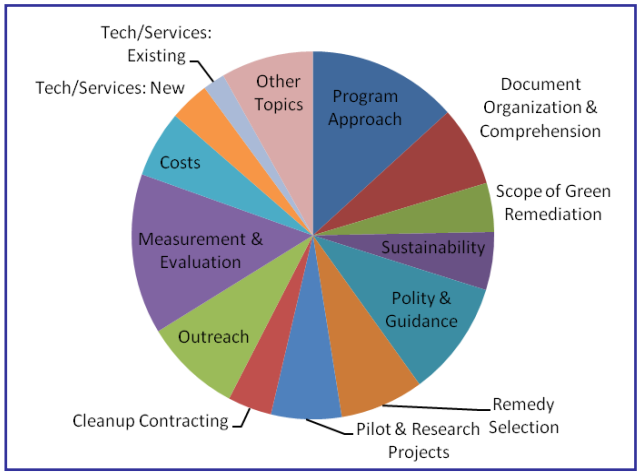
In September 2009, the U.S. Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response (OSWER) released its August 2009 *Superfund Green Remediation Strategy* for public review. EPA received written comments from 29 organizations and individuals representing government agencies, industry, cleanup contractors or consultants, product vendors, non-profit organizations, and private concerns. The comments provided a valuable contribution to a deliberative process that resulted in the September 2010 edition of the Strategy.

This summary describes:

- ***General or verbatim comments*** submitted to EPA in September through November 2009, and
- ***EPA's responses***, as reflected in the September 2010 Strategy and associated plan for implementing the Strategy's 40 actions.

The public feedback, encompassing nearly 100 pages of more than 250 broad or detailed comments, is categorized in four subject areas:

- ***Scope***
- ***Policy and guidance development***
- ***Demonstrating and enabling the use of green remediation practices***, and
- ***Program and project evaluation***.



Relative Distribution of Public Comments by Subject Area Categories

Scope

Comment: The Strategy focuses primarily on air quality protection; additional discussion and strategic actions are needed to address water protection/conservation, land resource protection and use, and materials reuse.

Response: EPA agrees and will continue to seek additional strategic actions addressing other core elements of green remediation in conformance with the Agency's *Principles for Greener Cleanups*, such as:

- Establish tools to track and increase potable water conservation, the reuse of treated water, and recharge of aquifers, and
- Identify additional onsite or offsite uses of materials or energy otherwise considered waste.

Comment: The Strategy should link the core elements of green remediation to Executive Order (EO) 13514 issued in October 2009.

Response: EPA agrees and has updated the Strategy to correspond with aspects of EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, which was issued after the Agency's release of the August 2009 Strategy. The updated Strategy recognizes the associated need for enhanced EPA efforts to:

- Increase energy efficiency
- Measure, report, and reduce greenhouse gas (GHG) emissions from direct and indirect sources
- Conserve and protect water resources through efficiency, reuse, and stormwater management
- Eliminate waste, recycle, and prevent pollution
- Leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services
- Design, construct, maintain, and operate high performance buildings in sustainable locations, and
- Strengthen vitality and livability of communities where federal facilities are located.

The Strategy also clarifies that:

- In context of EO 13514, EPA activities include government remediation of Superfund sites.
- Draft guidance on federal GHG accounting and reporting indicates that emissions associated with this activity are subject to "scope 3" voluntary reporting.

Comment: Expand the summary of "Key Actions" to include all specific actions, and clarify the timeframes and implementation status of the actions.

Response: EPA is tracking progress on all actions outlined in the Strategy, as listed in the document's Executive Summary. Of the 40 strategic actions, 7 have been implemented, 32 are under development, and 1 will be initiated shortly. Completed tools or other products associated with each action will continue to be posted on EPA's *Superfund & Green Remediation* website (www/epa.gov/superfund/greenremediation) and the *Green Remediation Focus* area of the Agency's CLU-IN Web platform (www.cluin.org/greenremediation).

Comment: The Strategy should capture the broader context of sustainability, including social and economic impacts in addition to environmental aspects, or otherwise clarify how "green" and "sustainable" are different.

Response: In conformance with OSWER's *Principles for Greener Cleanup* and the Agency's broader sustainability goals, the Strategy will continue to focus on the environmental footprint of a Superfund response action operating within the existing regulatory framework. When green remediation techniques are linked to careful site reuse planning and sustainable development practices, such as applying smart growth principles and green building methods, additional opportunities are often created to reduce the environmental footprint of both remediation and reuse projects. The broader realm of site sustainability examines environmental issues but also includes social and economic aspects that are typically addressed by site users and local or regional communities.

Comment: The Strategy should include a core element to increase worker safety and reduce human health risk related to remediation activities, particularly construction and transportation.

Response: EPA agrees that worker protection and reduction of human health risk is critical to the process of cleaning up hazardous waste sites. Comprehensive planning for worker safety protection is part of the existing process for Superfund remedy selection and implementation, including compliance with Occupational Safety & Health Administration (OSHA) regulations covering hazardous waste operations and emergency response (29 CFR 1910.120*).* Procedures for complying with these regulations are documented in site-specific health and safety plans. To avoid potentially compromising OSHA compliance or reducing remedy protectiveness, EPA is not adding this aspect as an additional core element of green remediation.

Comment: The Strategy does not address GHG emissions from Superfund sites themselves, such as landfills and polluted waters. GHGs such as methane and nitrous oxide are 25 and 300 times more potent, respectively, than carbon dioxide (per pound of emission).

Response: EPA intends for green remediation strategies to be used as a means to enhance remedy protectiveness achieved through compliance with existing CERCLA requirements and the NCP. Accordingly, EPA has updated the Strategy to reflect additional actions for enhancing remedy protectiveness. One example is an action specific to recovery, rather than exclusive "waste" treatment, of methane gas from Superfund landfills and its conversion to useful energy. The Agency is developing a landfill methane-to-energy screening tool to help decision makers evaluate technical feasibility of landfill methane recovery, associated cost and practicality, and anticipated reduction in GHG emission from the landfills.

Policy and Guidance Development

Comment: Policy or guidance with definitive instructions on how to evaluate green remediation options under CERCLA requirements and relevant NCP provisions is needed to strengthen usability of the Strategy at individual sites, including the context of remedy selection criteria, five-year reviews, engineering evaluation/cost analyses (EE/CAs), institutional controls, applicable or relevant and appropriate requirements, and aspects "to be considered."

Response: EPA agrees and plans to issue OSWER policy on how green remediation strategies can factor into the NCP's nine evaluation criteria for remedy selection and the Superfund evaluation criteria for non-time critical removal actions involving the EE/CA process. The policy is anticipated to also describe considerations in potential amendment of decision documents for an existing remedy, such as remedy protectiveness, integrity, and cost.

Comment: EPA should develop consistent policy and guidance applying to all EPA regions; region-specific policy could result in inconsistent application of green remediation concepts within the Superfund Program.

Response: EPA agrees. On August 27, 2009, the Agency issued the *Principles for Greener Cleanups* policy applying to all cleanup programs administered by OSWER and regional EPA offices. The full policy is available online at: www.epa.gov/oswer/greencleanups/principles.html. Policies individually issued by the ten EPA regional offices recognize and build on these principles in ways that reflect regional priorities. All EPA regional policies can be accessed online at: www.cluin.org/greenremediation/regions.

Comment: Strengthen EPA's role in developing green remediation policy and guidance by including activities going beyond EPA "considerations."

Response: EPA agrees. The updated Strategy clarifies the Agency's plan to actively implement the strategic actions, including those addressing policy and guidance development. The Strategy also highlights a series of Program initiatives to expedite pursuit and use of green remediation practices.

Comment: Clarify if the upcoming policy and guidance will pertain to all phases of the Superfund process or be limited to remedy selection and implementation.

Response: EPA's upcoming policy will extend to all Superfund response actions, including non time-critical removal actions, site investigations, feasibility studies, remedial design, and remedy implementation. The Agency recognizes that green remediation strategies may have less applicability in time critical removals and particularly in emergency response situations.

Demonstrating and Enabling the Use of Green Remediation Strategies and Practices

Comment: The Agency needs to clarify its intent to identify financing opportunities for green remediation strategies at Fund-lead sites.

Response: One strategic action focuses on developing a better understanding of the costs or savings associated with use of green remediation strategies and best management practices (BMPs). The Agency plans to work with other federal agencies, states, and private industry to find independent financing mechanisms or incentives such as loans or grants, expedited permitting processes used by state or local government agencies, cleanup contractor bonuses, a green cleanup certification system, and/or purchases of renewable energy certificates (RECs). The Agency plans to capitalize on research, development, and demonstration funding available from existing federal resources to identify or demonstrate new BMPs. The Agency also will explore feasibility of establishing revolving EPA funds for certain green remediation activities at Fund-lead sites.

Comment: The Strategy could highlight straightforward BMPs to reduce material consumption and waste generation during site cleanup, such as instituting "green communications" (including electronic media for progress reports, correspondence, invoice submittals, and long-term document storage), teleconference meetings, and shared vehicle trips to in-person meetings. Other BMPs could address technical issues involved with the energy-intensive pump and treat (P&T) systems used at many sites; for example, P&T implementation could be enhanced through use of combined heat sources, solar thermal energy, geothermal heating/cooling pumps, utility demand response programs, and increased use of value engineering.

Response: EPA implementation of the Strategy includes developing a series of fact sheets outlining the BMPs associated with commonly used cleanup technologies (such as P&T systems or soil vapor extraction) and BMPs associated with activities common to all cleanups (such as site investigation and use of renewable energy resources). Each fact sheet describes BMPs applying to the core elements of green remediation. All completed fact sheets and a listing of upcoming fact sheet topics are available at: www/cluin.org/greenremediation.

Comment: The Agency should emphasize the need to explore variations and verification levels associated with RECs before purchasing RECs.

Response: EPA recognizes that REC purchasing provides one option for increasing use of renewable energy in site operations and agrees that today's market offers a range of REC categories meeting different criteria for renewable energy. EPA's Office of Superfund Remediation and Technology Innovation (OSRTI) will lead development of a fact sheet on using green power for site cleanup through REC purchases as well as small-scale onsite production for direct use or utility sale/credit, power purchase agreements, and commercial-scale production of energy from onsite resources.

Comment: Please provide more detail regarding the Agency's pilot project on incorporating green remediation into remedy optimization evaluations.

Response: Following a successful pilot effort in FY 2010, the Program will continue to incorporate green remediation into future remedy optimization reviews. The reviews include pursuit of energy efficiency and alternative energy sources, reduction of air emissions, water conservation, efficiencies in materials use, reduction of waste generated by the remedy, use of recycled materials, minimized habitat destruction, and other key green remediation considerations relevant to the operating remedies. Combined reviews of site-specific remediation system optimization and green remediation strategies ("RSE & GR evaluations") are available, when completed, at: http://www.clu-in.org/greenremediation/subtab_b3.cfm.

Comment: The Strategy should clarify contracting opportunities that are specific to EPA contracts.

Response: The updated Strategy clarifies that the Agency is actively pursuing opportunities to modify EPA contract language to include green remediation practices, including requirements for reporting selected activities. The Agency will identify upcoming solicitations and develop language for the statements of work (SOWs) and requests for proposals, and will modify SOW language in existing remedial and removal contracts (both region-wide and site-specific) and work assignments or task orders whenever possible. The Agency also plans to develop national model contract language that contains SOWs referencing EO 13514, federal mandates, and adaptations of EPA regional specifications. Model language and sample administrative processes will be available in the Agency's periodically updated *Green Response Action Contracting and Administrative Toolkit* (at www.cluin.org/greenremediation).

Program and Project Evaluation

Comment: Clarify which data will be included in the Program- and project-level baselines and at which types of sites these data will need to be captured.

Response: The Agency is using an empirical model to estimate a Program baseline, due to the absence of centralized data on issues such as energy and fuel consumption, water use, consumption of raw materials, and waste generation. EPA has refined the Strategy to clarify that a Program baseline for the environmental footprints of Superfund cleanups will be based on an empirical model reflecting: (1) preliminary studies of historic information, and (2) aggregation of new information gained from pilot studies, integrated RSE & GR evaluations, and site-specific reports gathered by EPA regions through cleanup contracts. EPA anticipates that project-level baselines will be estimated on a site by site basis through use of a methodology currently under development by the Agency or alternate methods deemed suitable by project managers.

Comment: Clarify the methods EPA will use to evaluate performance of the Strategy, and how the Strategy's performance may relate to the Agency's reporting under the Government Performance Results Act or EO 13514.

Response: EPA has refined the Strategy to clarify that performance goals, objectives, and measures for the Strategy (as a component of the Superfund Program) will evolve through a formative evaluation using a logic model to: identify specific goals and objectives potentially incorporated into EPA's Strategic Plan; identify performance measures related to the Strategy; and measure environmental outcomes derived from implementation of the Strategy over time. OSWER anticipates that quantitative and qualitative tools established through the formative evaluation will provide new data for EPA reports responding to EO 13514.

Comment: The Strategy should clarify the various parties involved in establishing a consensus on green remediation measures and metrics and conduct an internal test of the measures and metrics before requiring other agencies to begin associated reporting.

Response: EPA is gathering information on suitable measures and metrics used in five pilot projects in partnership with other agencies and private parties. The Agency has completed or undertaken pilot projects at: Romic East Palo Alto, CA, and BP Wood River, IL. (Compiled results on each pilot, including detailed methodologies, are posted when available at: http://www.cluin.org/greenremediation/subtab_b3.cfm.)

Comment: The Strategy does not address how to weigh or otherwise compare values of green remediation attributes such as carbon lifecycles, energy consumption and costs, or water balance.

Response: The Strategy's "roadmap" for evaluating environmental footprints of a cleanup at a project level includes OSWER development, testing, and public release of four evaluation modules (documents) specific to: (1) energy, atmosphere, and air quality, (2) water, (3) land and ecosystems, and (4) materials and waste. EPA does not plan to develop a universal weighting system due to the high variability of site conditions across the Superfund Program; differences in regional, state, or local priorities; and variation in anticipated site reuse that may affect cleanup activities.